10/601,682

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, listings, of claims in the application:

Claim 1 (original): A method for detecting and automatically identifying defects in technical equipment, wherein measurement signals varying with time are measured by means of a known measuring device, and the results of the measurements in the form of spectrograms are downloaded to the memory of a computer, to which appropriate data bases are also downloaded, characterised in that in the first stage peaks of amplitude values bigger than a specified set amplitude threshold value are selected from at least one spectrogram, of which peaks a set of designated peak values is created, then the ratio of the frequency of each peak to the frequency of the other peaks is calculated for all peaks of this set, whereupon, depending on the value of the obtained quotient, the set of designated peak values is divided into two subsets, and then in the second stage in one of the subsets successive specific peak groups are distinguished, which differ from each other by the values of the basic frequency, constituting one of the product factors, consistently recurring in one of these groups, whereupon for peaks from every specific peak group the presence of sidebands is sought for in the second subset created from the set of designated peak values and if the presence of sidebands is found, the basic frequency of the sidebands is calculated, after which, in stage three, the presence of a defect in the technical equipment is detected, which is then identified by comparing the basic frequencies and the basic frequencies of the sidebands with the frequency values collected in the computer device memory, in the data signature base and in the base containing technical data of the technical equipment, and then the result of such analysis of the spectrogram or spectrograms is presented by means of a results visualisation device coupled with the computer device.

Claim 2 (original): A method according to claim 1, characterised in that in the first stage the set of designated peak values is divided into two subsets of peaks, one subset comprising such peak values for which the ratio of their frequency values to the frequency values of all the other peaks is expressed by a quotient of integers smaller than 10, and the other peak subset consists of all the other peaks.

Claim 3 (original): A method according to claim 1, characterised in that in the second stage, the second subset created from the set of designated peak values is searched for the presence of sidebands for any peak pairs, by calculating the ratios of the difference between the frequency value of one peak of the given peak pair and the frequency value of the nearest peak from a specific peak group to the difference between the frequency value of the second peak of the given pair and the frequency value of the nearest peak from a specific peak group, after which, depending on the value of the obtained quotient, a new subset is created in the second subset, from which there are then separated subsequent peak groups differing from each other by the values of the basic frequency of the sidebands, which basic frequency is one of the factors of the quotient, consistently recurring in one of these groups.

Claim 4 (original): A method according to claim 3, characterised in that the new peak subset created from peak pairs in the second subset consists of such peak pairs, for which the calculated ratios of the difference between the frequency value of one peak from the given peak pair and the frequency value of the nearest peak from the specific peak group to the difference between the frequency value of the second peak from the given pair and the frequency value of the nearest peak from the specific peak group, are expressed in the form of quotients of integers of absolute value smaller than 10.

Claim 5 (new): A device for detecting and automatically identifying defects in technical equipment, comprising:

a measurement device for measuring signals varying in time;

a processor having a memory, said processor connected to said measurement device and operable to store the measured signals in the form of spectrograms and to perform a method comprising:

selecting first stage peaks of amplitude values bigger than a specified set amplitude threshold value from at least one spectrogram, of which peaks a set of designated peak values is created, then the ratio of the frequency of each peak to the frequency of the other peaks is calculated for all peaks of this set, whereupon, depending on the value of the obtained quotient, the set of designated peak values is divided into two subsets, and then in the second stage in one of the subsets successive specific peak groups are distinguished, which differ from each other by the values of the basic frequency, constituting one of the product factors, consistently recurring in one of these groups, hereupon for peaks from every specific peak group the presence of sidebands is sought for in the second subset created from the set of designated peak values and if the presence of sidebands is found, the basic frequency of the sidebands is calculated, after which, in stage three, the presence of a defect in the technical equipment is detected, which is then identified by comparing the basic frequencies and the basic frequencies of the sidebands with the frequency values collected in the processor memory, in the data signature base and in the base containing technical data of the technical equipment.

Claim 6 (new): The device of claim 5 wherein said method performed in said processor further comprises presenting by a visualization device the presence of a defect detected in said technical equipment.

Claim 7 (new): The device of claim 5 wherein said method performed in said processor further comprises dividing said first stage set of designated peak values into two subsets of peaks, one subset comprising such peak values for which the ratio of their frequency values to the frequency values of all the other peaks is expressed by a quotient of integers smaller

than 10, and the other peak subset consists of all the other peaks.

Claim 8 (new): The device of claim 5 wherein said method performed in said processor further comprises searching said second subset created from the set of designated peak values for the presence of sidebands for any peak pairs, by calculating the ratios of the difference between the frequency value of one peak of the given peak pair and the frequency value of the nearest peak from a specific peak group to the difference between the frequency value of the second peak of the given pair and the frequency value of the nearest peak from a specific peak group, after which, depending on the value of the obtained quotient, a new subset is created in the second subset, from which there are then separated subsequent peak groups differing from each other by the values of the basic frequency of the sidebands, which basic frequency is one of the factors of the quotient, consistently recurring in one of these groups.

Claim 9 (new): The device of claim 8 wherein said new peak subset created from peak pairs in the second subset consists of such peak pairs and said method performed in said processor further comprises expressing for the calculated ratios of the difference between the frequency value of one peak from the given peak pair and the frequency value of the nearest peak from the specific peak group to the difference between the frequency value of the second peak from the given pair and the frequency value of the nearest peak from the specific peak group in the form of quotients of integers of absolute value smaller than 10.